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The Program in Audiology and Communication Sciences (PACS) at Washington University School of Medicine offers academic, clinical and research programs in the fields of audiology, deaf education, and speech and hearing sciences, leading to the following degrees:

- Doctor of Audiology (Au.D.)
- Master of Science in Deaf Education (M.S.D.E.)
- Doctor of Philosophy (Ph.D.) — Speech and Hearing Sciences

An undergraduate minor in speech and hearing sciences is also available to qualified students through Washington University in St. Louis, College of Arts & Sciences.

With a long tradition of excellence, our programs provide training and real-world experience for future professionals. As a member of a consortium of programs known as CID at Washington University School of Medicine, PACS students benefit from on-campus academic, clinical and research programs related to the fields of hearing and deafness, as well as the on-campus Central Institute for the Deaf (CID) school. Graduate students work side by side with other students, studying the underlying processes of speech, language and hearing and their disorders, as well as with leading researchers, clinicians, teachers of the deaf and faculty members. This personalized approach to graduate education offers the advantages of a small college campus with the benefits of a world-renowned medical center, university and metropolitan area.
The Doctor of Audiology (Au.D.) program is a four-year, post-baccalaureate course of study designed to prepare students as clinical audiologists. Administered through Washington University School of Medicine, the program is designed to prepare students as independent clinicians, emphasizing the latest advances in evaluation and treatment of hearing and balance disorders. The curriculum has a strong foundation in the sciences and research methods, and is designed to build clinical skills through hands-on experiences.

Washington University and the Central Institute for the Deaf (CID) partnered in 1947 to offer one of the country’s first training programs in audiology, offering both master’s and Ph.D. degrees in the field. In the decades that have followed, we have continuously provided students with graduate training in clinical audiology and have helped define the ever-expanding scope of practice for the field. Today, Washington University’s audiology program is known as one of the oldest and most prestigious training programs of its kind and is ranked No. 5 in the country by U.S. News & World Report. The program is also internationally recognized, and students have come from more than 30 countries to study with us.

The Field of Audiology

Audiology is the science of hearing and the study of auditory and vestibular processes. Students study the development, anatomy, physiology and pathology of the auditory and vestibular systems, as well as the evaluation, rehabilitation and psychological aspects of hearing and balance disorders. Audiologists work with all age populations, from infants to the elderly, in clinical settings, such as hospitals, schools and clinics. They measure hearing ability, identify hearing and balance disorders, provide rehabilitative services, provide speechreading training, assist in differential diagnosis of sensory and neurological disorders, assess the need for amplification devices such as hearing aids and cochlear implants, and instruct clients in the care of hearing devices. Many audiologists also serve as consultants to industry and government on issues related to environmental, noise-induced hearing loss.
Coursework and Clinical Experiences

Students in the Au.D. program learn from both classroom-based instruction and hands-on experiences. Beginning with introductory coursework in the first semester and gradually progressing to advanced coursework in later semesters, students gain knowledge in the basic and applied sciences, evaluation and diagnosis practices, and intervention strategies.

Students are also given many opportunities to put into practice what they have studied in the classroom, with observation and practicum experiences beginning in the first semester. Washington University offers its students opportunities to participate in a variety of clinical services at a number of practicum sites. Experiences across the life-span — from infancy through geriatrics — are available in areas such as comprehensive audiological evaluations, hearing aid selection and fitting, cochlear implant evaluation and follow-up, aural rehabilitation, vestibular evaluation and treatment, electrophysiology, auditory processing disorder (APD) evaluations, and much more. Each practicum experience takes place under the supervision of an experienced, fully licensed, and ASHA-certified audiologist.

In each successive semester, time spent in academic courses is reduced and time spent in practicum is increased. By the end of the third year of study, students have gained extensive clinical experience across the scope of practice for audiology. In the fourth year, students engage in a nine- to 12-month externship, with opportunities available across the country. Recent externship sites have included Boys Town National Research Hospital; CID — Central Institute for the Deaf; Dartmouth-Hitchcock Medical Center; Mayo Clinic; St. Joseph Institute for the Deaf; and Veterans Administration (VA) and military hospitals in Hawaii, Missouri, Tennessee and California.

The Au.D. program curriculum was developed in accordance with the recommendations and guidelines of the American Speech-Language-Hearing Association (ASHA), the Accreditation Commission for Audiology Education (ACAE) and the Council of Academic Programs in Communication Sciences and Disorders (CAPCSD).

Research Opportunities

Research is an important aspect of the doctoral program, and students are strongly encouraged to pursue their individual interests. Many opportunities are available for students to work with faculty members in a number of disciplines to develop their research skills. PACS is closely affiliated with the Department of Otolaryngology and its research centers, including the Fay and Carl Simons Center for Biology of Hearing and Deafness, the Center for Childhood Deafness and Adult Aural Rehabilitation, the Hearing Aid Research Laboratory and the Research Center for Auditory and Vestibular Studies.

In the third year, coursework culminates in the completion of a Capstone Project, which is completed under the supervision of one or more members of the faculty. This original research project is submitted in publishable format and presented at the annual PACS Student Research Colloquium. Students must also successfully complete a comprehensive examination.

In addition, Washington University School of Medicine offers Au.D. students several unique, intensive research training opportunities. Two- and three-month summer and one-year “step out” programs funded by the National Institutes of Health (NIH) are available.

Additional information can be found at t32.im.wustl.edu or by contacting the PACS office.
Outlook

According to the U.S. Department of Labor, employment of audiologists is expected to grow 25 percent through 2018. Factors such as improved survival rates of premature infants, mandatory newborn hearing screenings, an expanding network of early intervention programs, growth in elementary and secondary school enrollments, an aging population and an increased demand for services from individuals in private practice have all contributed to the rapid changes in the field and unprecedented demand for highly trained professionals to serve individuals with hearing loss and hearing-related disorders. It is an exciting time to enter the field of audiology, and Washington University School of Medicine’s program is internationally recognized as one of the world’s best academic and practical training centers.

Accreditation and Certification

The Au.D. program at Washington University School of Medicine is accredited by the Council on Academic Accreditation in Audiology and Speech-Language Pathology of the American Speech-Language-Hearing Association, 2200 Research Blvd. #310, Rockville MD 20850, (800) 498-2071 or (301) 296-5700. The program is also accredited by the Accreditation Commission for Audiology Education (ACAE).

Practicum Sites

Practicum experiences are available both locally and nationally. More than 40 sites in the St. Louis metropolitan area are used, including the examples listed below. Many other national sites are available for summer rotations and externship opportunities.

- Associated Hearing Professionals
- Ballas ENT Consultants
- Belleville Area Special Service Cooperative
- Center for Hearing and Balance Disorders
- Center for Hearing and Speech
- Central Institute for the Deaf (CID) School
- Ear Care & Skull Base Surgery
- Ellisville Hearing Center
- ENT Associates, Inc.
- ENT Institute of Southern Illinois
- Hearing Healthcare, Inc.
- Hometown Hearing and Audiology
- Illinois Special School District — Region III
- Midwest ENT & Associates
- Midwest Head and Neck Surgery
- Moog Center for Deaf Education
- Oto-Aids
- Saint Louis University — Department of Otolaryngology
- St. Elizabeth’s Hospital
- St. John’s Mercy Medical Center
- St. Joseph Institute for the Deaf
- St. Louis Children’s Hospital — Pediatric Audiology Clinic
- St. Louis Children’s Hospital — Pediatric Cochlear Implant Program
- Special School District of St. Louis County
- Washington University School of Medicine — Division of Adult Audiology
- Washington University School of Medicine — Hearing Rehabilitation and Cochlear Implant Program
# Doctor of Audiology (Au.D.) Curriculum

## YEAR ONE

### Fall Semester
- 401 Anatomical and Physiological Bases of Speech and Hearing
- 421 Introduction to Electroacoustics
- 434 Normal Language Development*
- 460 Observation and Practicum in Audiology
- 551 Research Seminar
- 5601 Clinical Audiology I
- 574 Statistics and Research Methods

### Spring Semester
- 433 Acoustical Phonetics and Speech Perception
- 460 Observation and Practicum in Audiology
- 505 Auditory Neuroscience
- 543 Survey of Speech and Language Disorders*
- 5602 Clinical Audiology II
- 565 Hearing Devices in Audiology I: Hearing Aids

### Summer Semester
- 4610 Practicum in Audiology
- 569 Hearing Disorders

## YEAR TWO

### Fall Semester
- 414 Hearing (Psychoacoustics)
- 4611 Practicum in Audiology
- 5001 Electrophysiologic Techniques I
- 5652 Hearing Devices in Audiology II: Hearing Aids

### Spring Semester
- 4612 Practicum in Audiology
- 507 Vestibular Disorders
- 511 Hearing Conservation
- 5700 Capstone Project

## YEAR THREE

### Fall Semester
- 470 Practice Management in Audiology
- 472 Professional Issues and Ethics in Audiology
- 4614 Practicum in Audiology
- 466 Rehabilitative Audiology
- 506 Genetics in Hearing Loss

### Spring Semester
- 4615 Practicum in Audiology
- 507 Vestibular Disorders
- 511 Hearing Conservation
- 5700 Capstone Project

## YEAR FOUR

### Fall Semester
- 4620 Clinical Externship in Audiology

### Spring Semester
- 4621 Clinical Externship in Audiology

*Additional PACS courses are also available as electives, but electives are not required.
*These courses may be waived if an equivalent course has been completed.

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Au.D. students in the PACS program are exposed to a wide range of clinical sites, knowledgeable faculty with both clinical and research interests, and a curriculum catered to the professional needs of the future. The ability to garner clinical, basic science and translational research experience is evidence of the comprehensive knowledge base that Washington University in St. Louis provides to all students.

— Dan Putterman
Au.D. student
B.A., Biology,
Lawrence University

PACS has provided students with both clinical and research opportunities unsurpassed by any other institution. The support and caring nature of the staff has far exceeded my every expectation.

— Deborah Miller,
Au.D. student
B.S., Speech and Hearing Sciences, University of Washington
**The Master of Science in Deaf Education (M.S.D.E.)** program prepares students as teachers of the deaf and hard of hearing. Administered through Washington University School of Medicine, the program endorses a family-centered approach to preparing teachers, emphasizing the individual needs of children and their families. The curriculum has a strong foundation in the development of speech, language and social skills in children, early intervention, and audiology. Graduate students build their knowledge and skills through intensive hands-on student teaching experiences.

In 1914, the Central Institute for the Deaf (CID) began one of the first auditory-oral teacher training programs in the country. In 1931, a partnership with Washington University established the first deaf-education teacher training program in the country to be affiliated with a university. This bachelor’s degree program continued to grow, and in 1936 a master’s degree program was added. Today, Washington University’s deaf education program is known as one of the oldest and most prestigious training programs in the world, and students have come from more than 30 countries to study with us.
The Field of Oral Deaf Education

The program promotes the philosophy of oral deaf education — that children who are deaf or hard-of-hearing can learn to listen and talk — and prepares teachers to help children develop their spoken and written language skills through current teaching strategies and auditory technologies, such as cochlear implants and digital hearing aids.

Students study the educational, practical and scientific foundations necessary for providing the highest-quality education for hearing-impaired children — from the first sounds and words children learn to speak to putting together sentences and conversational discourse. Students first learn and later participate in this process, from the first diagnosis and early intervention through family-centered counseling and educational options for the child. Students also learn about the many assistive listening devices available including digital hearing aids, cochlear implants, FM systems and sound field systems. For more information on oral deaf education, please visit www.oraldeafed.org.

Coursework and Student Teaching Experiences

Students in the M.S.D.E. program learn from both classroom-based instruction and hands-on experiences. Degree candidates progress from broadly-based classroom instruction and observation to progressively more specialized coursework and practice teaching. In each successive semester, time spent in academic coursework is reduced and time spent in practice teaching is increased.

The M.S.D.E. curriculum is comprehensive, emphasizing current knowledge and skills. The two-year (four semester) program meets the needs of most students, including those with limited or no background and/or experience in deaf education. This two-year program fulfills the certification requirements of the State of Missouri (Deaf/Hearing Impaired, Birth-Grade 12) and the Council on Education of the Deaf (Early Childhood and Elementary). A one-year (two semester) program is also available for students with a degree in deaf education and significant teaching experience in the field. Each program requires an independent study in lieu of a master’s thesis, which is completed under the guidance of one or more faculty members, and successful completion of a comprehensive examination.

Students also benefit from immersion in hands-on teaching experiences, including those at three area auditory-oral schools and local public school districts, as well as additional, optional experiences around the country. For those who are also interested in the medical issues related to hearing and deafness, our affiliations with a world-class medical school and top hospitals allow unique opportunities such as observing cochlear implant surgeries and touring a hospital neonatal intensive care unit.
Outlook

There are numerous opportunities for oral deaf educators nationwide. Many factors have contributed to the rapid changes in the field of deaf education and created an unprecedented demand for highly trained professionals including improved early intervention programs, growth in school enrollments, improved technology in hearing aids and cochlear implants, and the requirement that every school district in the United States offer special education services for deaf or hard-of-hearing children. It is an exciting time to enter the field of deaf education, and Washington University School of Medicine's program is internationally recognized as one of the world's best academic and practical training centers.

Accreditation and Certification

Washington University’s M.S.D.E. program is fully accredited by the Missouri Department of Elementary and Secondary Education (DESE) and the Council on Education of the Deaf (CED). Graduates of the two-year M.S.D.E. program are eligible for initial teacher certification in the State of Missouri (Deaf/Hearing Impaired, B-12) and by the Council on Education of the Deaf (CED) at the Early Childhood and Elementary levels.

Practice Teaching Sites

Student teaching experiences are available both locally and nationally. A number of local public schools and private schools for the deaf serve as practicum sites for students enrolled in the M.S.D.E. program. On a national level, both private and public schools across the country often host students for one-month student teaching opportunities. Some examples of recent practice teaching sites are listed below.

St. Louis Metro Area Sites:
- Central Institute for the Deaf (CID)
- Fox C-6 School District
- Moog Center for Deaf Education
- St. Joseph Institute for the Deaf
- Special School District of St. Louis County
- United Services

National Sites:
- Atlanta Speech School (Atlanta, Ga.)
- Child’s Voice (Metropolitan Chicago Area, Ill.)
- Clarke School for Hearing and Speech (Northampton, Mass.)
- Clarke School for Hearing and Speech (Jacksonville, Fla.)
- Clarke School for Hearing and Speech (New York)
- Columbia Public Schools (Columbia, Mo.)
- Denver Public Schools (Denver, Colo.)
- DePaul School for Hearing and Speech (Pittsburgh, Pa.)
- Grant Wood Area Education Agency (Cedar Rapids, Iowa)
- Listen and Talk (Bothell, Wash.)
- Northern Voices (Roseville, Minn.)
- Sunshine Cottage School for Deaf Children (San Antonio, Texas)
Two-Year Curriculum

YEAR ONE

Fall Semester
401  Anatomical and Physiological Bases of Speech and Hearing
4011  Behavior Management
422  Basic Acoustic Measures
434  Normal Language Development*
4515  Language Instruction for Hearing-Impaired Children
5601  Clinical Audiology I

Spring Semester
4501  Observation and Practicum in Education of the Hearing Impaired
433  Acoustical Phonetics and Speech Perception
4525  Reading Instruction for Hearing-Impaired Children
454  Education Curricula for Hearing-Impaired Children
458  Speech for Hearing-Impaired Children
519  Psychosocial and Educational Aspects of Deafness

Summer Semester (Short Course)
444  Amplification Systems and Aural Rehabilitation for Children

YEAR TWO

Fall Semester
416  Evaluation Techniques for the Hearing and Language Impaired
436  Introduction to Manual Communication*
4511  Practicum in Education of the Hearing Impaired
4513  Practicum in Reading for the Hearing Impaired
455  Education Curricula for Hearing-Impaired Children
444A  Amplification Systems and Aural Rehabilitation for Children (Lab)
555  Early Intervention: Serving Hearing-Impaired Children Birth to Age 5

Spring Semester
4512  Practicum in Education of the Hearing Impaired
4514  Practicum in Reading for the Hearing Impaired
457  Counseling Parents of Hearing-Impaired Children
558  Teaching Portfolio
570  Independent Study
572  Evaluating and Reporting Research in Speech and Hearing

*These courses may be waived if an equivalent course has been completed.

One-Year Curriculum (Sample)

Fall Semester
416  Evaluation Techniques for the Hearing and Language Impaired
4500  Observation in Education of the Hearing Impaired
4515  Language Instruction for Hearing-Impaired Children
555  Early Intervention: Serving Hearing-Impaired Children Birth to Age 5
5601  Clinical Audiology I

Spring Semester
4512  Practicum in Education of the Hearing Impaired
4525  Reading Instruction for Hearing-Impaired Children
457  Counseling Parents of Hearing-Impaired Children
458  Speech for Hearing-Impaired Children
570  Independent Study
572  Evaluating and Reporting Research in Speech and Hearing

Master of Science in Deaf Education (M.S.D.E.)

I believe the deaf education program holistically prepares its students for their future careers. Not only do I feel prepared to actually teach in my own classroom, but I also feel prepared to work and educate parents and effectively form a collaborative partnership with audiologists and speech-language pathologists in order to best serve children who are deaf or hard of hearing.

— ROBYN KIRK,
M.S.D.E. student
B.S., Speech and Hearing Science, University of Illinois

Throughout my two years as a PACS graduate student, I gained a wealth of knowledge and experiences that will serve me tremendously in my future as a teacher. The supportive faculty, small class sizes, and ample student teaching experiences have helped me grow and learn in ways no other program can match.

— ROBYN MORTENSON,
M.S.D.E. student
B.A., Communication Disorders, Truman State University
In 1947, Washington University and Central Institute for the Deaf (CID) partnered to offer one of the first Doctor of Philosophy (Ph.D.) programs in audiology in the country. At the time, a primary goal of the Ph.D. program was to emphasize “advanced instruction and research … to include the numerous branches of knowledge involved in problems of hearing.” Today, the Speech and Hearing Sciences (Ph.D.) program carries on this mission, emphasizing scientific inquiry in the disciplines related to speech and hearing sciences. The program is administered through Washington University in St. Louis’ Graduate School of Arts & Sciences.

Coursework, Teaching Experiences and Research Opportunities

The Ph.D. program prepares students for academic and research careers in speech and hearing sciences. The curriculum includes coursework, teaching experiences and research training based on the student’s individual interests, culminating in a dissertation.

Coursework is drawn from departmental offerings, including statistics and research methods. Coursework may also be drawn from related departments in affiliated areas of study.

Teaching experiences are designed to prepare Speech and Hearing (Ph.D.) students to become effective teachers and communicators of their discipline and their intellectual research endeavors. Objectives of these teaching experiences include: providing students with adequate breadth and depth of teaching experiences, providing faculty mentoring and enhancing the overall training for Ph.D. students. The specific teaching requirements for Ph.D. students are:

1) Participating in one introductory course in speech and hearing sciences by either providing guest lectures or by serving as a graduate student assistant; a faculty mentor will be assigned to provide ongoing guidance, support, and feedback throughout the experience.

2) Participating in one advanced course in speech and hearing sciences, by providing guest lectures or by serving as a graduate student assistant; a faculty mentor will be assigned to provide ongoing guidance, support, and feedback throughout the experience.

3) At least one additional elective experience of the student’s choosing. Any elective must be approved in advance by the department. For example, workshops on a variety of topics related to teaching are available through the Teaching Center and participation in one such workshop would fulfill this requirement. For more motivated students, the Teaching Center offers the Teaching Citation, which provides additional expertise and opportunities in teaching for Ph.D. students. Other opportunities are available to Ph.D. students in the department. Appropriate mentoring will be provided.

As described above, items (1) and (2) will occur sequentially and will begin after one year of full-time study, unless otherwise approved by the department. Elective experiences may be completed at any point during the student’s course of study.
All Ph.D. students are expected to immerse themselves in the world-class research environment of Washington University. Regular participation in colloquia, grand rounds, brown bag seminars, research seminars, journal clubs and other similar opportunities is expected of all students throughout their enrollment. In addition, students are strongly encouraged to actively pursue opportunities for publication in scholarly, peer-reviewed journals and to participate in professional conferences.

At least 72 semester hours are required to earn the Ph.D. Full-time enrollment is required, with students typically completing 48 semester hours in the first two years of study, followed by completion of the written and oral qualifying examinations. Students then submit the title, scope and procedure of the dissertation for approval, which then allows admission to candidacy for the Ph.D. Completion and defense of the dissertation is the focus in the final year(s) of study.

A maximum of 24 hours of graduate-level transfer credit may typically be applied toward the Ph.D., though this maximum is increased for students who have earned the following degrees at Washington University: 48 semester hours for students who have earned the Doctor of Audiology (Au.D.), 36 semester hours for students who have earned the Master of Science in Deaf Education (M.S.D.E.), or 33 semester hours for students who have earned the Master of Science in Speech and Hearing Sciences (M.S.S.H.).

**Affiliated Research Centers**

Washington University School of Medicine is one of the rare institutions graced with all of the resources required to advance medical science to the benefit of everyone. Expert clinicians, bright students and dedicated researchers are meeting the challenges of understanding the fundamentals of disease, then translating what they learn into clinical science quickly and effectively. Researchers working in the Harold W. Siebens Hearing Research Center, which includes both the Fay and Carl Simons Center for Biology of Hearing and Deafness, and the Center for Childhood Deafness and Adult Aural Rehabilitation in the Department of Otolaryngology are conducting seminal studies related to hearing and hearing loss.

In the Center for Childhood Deafness and Adult Aural Rehabilitation, scientists conduct research on the perception of speech and language by children who are deaf and hearing impaired, especially those using cochlear implants and hearing aids, on other issues related to deaf education and on adult aural rehabilitation. A major goal is to increase the prevalence of literacy among people who are deaf and hearing-impaired. Important functions of the center are to disseminate information obtained through research to parents and teachers of hearing-impaired children and to family members and caregivers serving hearing-impaired adults, and to develop assessment tools and training programs used to help these populations.

In the Fay and Carl Simons Center for Biology of Hearing and Deafness, scientists conduct experiments concerning sensory cell death, repair, regeneration and development. Ongoing and new studies are adding to our understanding of the molecular and cellular processes of the development of neural connections, hearing loss and the potential for future treatments. The center is also home to an NIH-funded research core that provides facilities and services for histological processing of middle and inner ear tissues, electron microscopy and auditory and vestibular testing. Research opportunities are also available through the Division of Adult Audiology’s Hearing Aid Research Laboratory and Dizziness and Balance Center, and through the Adult Hearing Rehabilitation and Cochlear Implant Program.

1Taken from “A Ph.D. Degree in Audiology: A Proposal for a Combined Course of Study and Research,” October 1947.
CID at Washington University School of Medicine

An alliance that began in 1931 between Central Institute for the Deaf (CID) and Washington University fundamentally changed and became a formal affiliation in September 2003, when, after decades of working together, Washington University School of Medicine purchased the CID buildings and entered into an historic agreement with nearby CID — one of the world’s leading education and research centers for hearing disorders.

This affiliation transferred CID’s graduate training program, hearing-research programs and adult audiology clinic, along with its state-of-the art, 66,000-square-foot campus and research facilities, into the School of Medicine. These programs became known collectively as CID at Washington University School of Medicine. The CID School continues to operate in these facilities, which it leases from Washington University School of Medicine.

Graduate degree programs in audiology, deaf education, and speech and hearing sciences moved into the School of Medicine’s newly formed Program in Audiology and Communication Sciences (PACS). Research and clinical programs moved into the Department of Otolaryngology, continuing to advance our mission to help people with hearing loss and strengthening the research efforts in the fields of hearing and deafness of one of the largest otolaryngology departments in the world. Work also continues in the Harold W. Siebens Hearing Research Center, which houses the Fay and Carl Simons Center for Biology of Hearing and Deafness and the Center for Childhood Deafness and Adult Aural Rehabilitation.

The Spencer T. Olin Hearing Clinic remained on the CID campus as part of the Department of Otolaryngology’s Division of Adult Audiology.
History

In 1914, Max Goldstein, M.D., a St. Louis physician, set out to do what many thought was impossible — teach deaf children to talk. Goldstein had done his postgraduate medical training in Europe, and while studying in Vienna, he met a professor who was teaching profoundly deaf children to talk. This experience became the genesis for Goldstein’s dream to convince the world that deaf children could learn to speak intelligibly, and for his idea of audition (the use of residual hearing) as an integral part of oral deaf education.

Goldstein began an aggressive campaign to pursue his dream of opening Central Institute for the Deaf (CID), a place where doctors and teachers could work together to help deaf people. Leaders from the academic, business and medical communities enthusiastically supported Goldstein’s dream, and the first CID school building was completed in 1916. The oral methods for instructing deaf children were groundbreaking and attracted worldwide attention.

In 1929, the school’s reputation for success had led to burgeoning enrollment. Community support came through again, and a larger building was erected in front of the first. The second school became a St. Louis landmark and still stands at 818 S. Euclid Ave., part of the modern campus. When it was completed, the building housed specialized soundproof laboratories as well as classrooms and facilities to help adults. Teachers measured children’s progress in response to new listening devices and educational strategies. Scientists were recruited from around the world to study the anatomy of animals’ ears, the science of hearing devices, techniques for diagnosing deafness, the sound of children’s voices, and other topics related to hearing and deafness.

In 1931, CID’s teacher training program affiliated with Washington University. This was the first deaf education teacher training program in the country to be affiliated with a university. In 1936, CID and Washington University began the country’s first master’s program in deaf education.

A number of government contracts were awarded to CID during World War II, with active research in areas such as the problems with hearing aids and rehabilitation of military personnel who returned from the war with hearing loss. This work helped lay the foundation for the field of audiology. CID was also a pioneer in the area of hearing testing and hearing aids, opening the country’s first hearing aid clinic in 1941. As a natural expansion of the research and clinical experience of the faculty, CID and Washington University partnered to establish one of the country’s first audiology programs in 1947, offering both master’s and doctoral degree programs.

CID and Washington University are well-known for their contributions to the fields related to speech and hearing, including the development of digital hearing-aid technology, the establishment of the first parent-infant program for hearing-impaired children, and the creation of educational curricula and assessment tools. Other basic and applied research efforts have contributed seminal findings about how the ear works, how it can become impaired, and how to assist rehabilitation efforts for individuals with hearing impairments. PACS faculty and staff have written leading textbooks in their fields, and many hold leadership positions in organizations around the world.

As we move into the future, we are proud to honor Goldstein’s dream. Through our collaborations, teachers of the deaf, audiologists, researchers, medical doctors and students work side by side to fulfill our mission. Work continues on the most progressive and promising techniques and technologies to ensure that tomorrow’s professionals receive training on the leading edge of technology.
Washington University
Washington University in St. Louis

Washington University in St. Louis is a medium-sized, independent university dedicated to challenging its faculty and students to seek new knowledge and greater understanding of an ever-changing, multicultural world. The university is among the world's leaders in teaching and research and draws students and faculty to St. Louis from all 50 states and more than 110 countries. With more than 13,000 undergraduate, graduate and professional students, Washington University offers more than 90 programs and nearly 1,500 courses in traditional and interdisciplinary majors. Founded in 1853, the university is highly regarded for its commitment to excellence in learning. Its programs, administration, facilities, resources and activities combine to further its mission of teaching, research and service to society.

Set amid a thriving metropolitan region, the university benefits from the array of social, cultural and recreational opportunities offered in the St. Louis area. The university's two principal campuses — the Danforth Campus and the Medical Campus — share borders with Forest Park, site of the 1904 World's Fair and one of the nation's largest metropolitan parks.

Washington University School of Medicine

The School of Medicine, founded in 1891, has a rich history of success in research, education and patient care. *U.S. News & World Report* ranks the school among the top five medical schools in the United States, and our students bring impressive credentials to their studies. Each year, many Washington University physicians are listed in *The Best Doctors in America*. Twelve faculty members are fellows of the National Academy of Sciences; 30 belong to its Institute of Medicine. Six faculty members are Howard Hughes Medical Institute investigators and 92 hold career development awards from the National Institutes of Health. Seventeen Nobel laureates have been associated with the School of Medicine.

Grants and contracts totaling more than $484 million supported faculty research efforts at the School of Medicine during the university fiscal year ending June 30, 2009. During the federal fiscal year ending Sept. 30, 2009, the School of Medicine received $347.9 million from the National Institutes of Health, coming in 653 separate grants. The school provides graduates with opportunities for highly competitive residencies and fellowships, challenging research endeavors and successful medical careers.
About St. Louis

The “Gateway to the West” is a thriving metropolitan area of 2.8 million residents that retains the friendly character of the Midwest. A multitude of activities and pursuits are readily available in St. Louis, but living here is easy and affordable.

At the heart of St. Louis is Forest Park. Located between the Danforth and medical campuses of Washington University, the park is a resource for those seeking outdoor fun or solitude. This large green space has facilities for tennis, golf, cycling, running, ice skating, sand volleyball, team sports and fishing. The park is home to several attractions — most of them with free admission — such as the Saint Louis Science Center, the Saint Louis Art Museum, the Missouri Historical Society and the Saint Louis Zoo.

St. Louis is a sports-minded city that enthusiastically supports professional baseball, football and hockey teams as well as semi-pro teams. Other types of entertainment also are available. The Missouri Botanical Garden is a stately oasis open year round. The Saint Louis Symphony Orchestra is one of the nation’s best, and several first-rate theater companies perform here. The Fox Theatre presents Broadway shows, dance performances and concerts. Blues, jazz and rock bands are prevalent in local clubs, and a large outdoor venue draws major concerts.

A light-rail line runs from Lambert International Airport through downtown, with a stop at Washington University School of Medicine. All full-time students at Washington University are eligible for a university-paid public transportation pass, allowing greater access to internships, community service opportunities, and cultural and entertainment venues.

The central location of St. Louis makes exploring nearby cities easy and inexpensive. For outdoor enthusiasts, canoeing, backpacking, cycling and camping are within easy driving distance in Missouri and Illinois.

Housing

Affordable, desirable housing can be found throughout St. Louis, including neighborhoods close to the Washington University Medical Center. One of the more popular areas, the Central West End, offers apartment living within walking distance and close to specialty shops, art galleries and restaurants. South of the medical center, the Forest Park Southeast area is adjacent to the CID campus. Within nearby commuting distance are the neighborhoods of Skinker-DeBaliviere, Dogtown and the Hill, each with its own history and flavor. University City and Clayton, which border Washington University’s Danforth Campus, are other popular locations for undergraduate and graduate students.
1914
Max Goldstein, M.D., a St. Louis otolaryngologist, founds CID – Central Institute for the Deaf. Goldstein envisions a place where parents, teachers and doctors would work together to help deaf children learn to listen and speak, and to train teachers of the deaf.

1916
First CID school building is started; CID speech and hearing clinic is established.

1921
CID becomes the first school for the deaf to install the Electrophone, an electronic device for amplifying sounds, and also acquires one of the world’s first audiometers — the Western Electric 1A.

1936
CID and Washington University collaboratively offer the country’s first master’s degree program in deaf education.

1939

1941
Goldstein dies at his summer home in Frankfort, Michigan.

1972
CID appoints Donald R. Calvert, Ph.D., as executive director.

1974
Davis receives the National Medal of Science, the government’s highest award for achievement in science and engineering. President Gerald Ford presents Davis with the award at the White House.

1976
Davis receives the National Medal of Science, the government’s highest award for achievement in science and engineering. President Gerald Ford presents Davis with the award at the White House.

1985
CID-affiliated scientists patent their invention of the world’s first fully digital, wearable hearing aid. The project, originally sponsored by the Veterans Administration, would later be shared with a consortium of international hearing aid manufacturers.
A new CID building opens at 818 S. Euclid Ave. This building serves as the home for the CID school for more than 70 years.

1930
CID’s hearing and deafness research department, which would come to be known as the birthplace of the science and profession of clinical audiology, opens.

1931
CID’s teacher training program affiliates with Washington University in St. Louis, which results in the first deaf education teacher training program in the country to be offered through a university. The program is extended from one year to two years.

1934
Goldstein arranges a hearing test for famous baseball player Dizzy Dean after Dean is hit on the head by a ball in the 1934 World Series.

1946
Hallowell Davis, M.D., a well-known pioneer in the development of electroencephalography, joins CID to establish a research department.

1947
CID and Washington University establish one of the country’s first audiology training programs, offering both master’s and Ph.D. degree programs.

1952
CID researchers develop and record the CID W-22, which is still used as one of the standard word lists for speech discrimination testing.

2001
CID completes its new 66,000-square-foot campus, featuring a specially designed “quiet school” and state-of-the-art research labs.

2003
An historic agreement transfers CID graduate programs, clinics and research to Washington University, establishing CID at Washington University School of Medicine.

2007
In April, PACS faculty members William W. Clark, Ph.D., and Kevin K. Ohlemiller, Ph.D., publish Anatomy and Physiology of Hearing for Audiologists, the field’s first textbook on the subject written for future and current audiologists.

2010
The graduate programs celebrate a milestone — the 100th graduate since the transfer to Washington University School of Medicine. A total of 114 degrees have been awarded since the 2003 merger.
Faculty

Professors (Joint)
Barbara A. Bohne, Ph.D.
Washington University, 1971
Richard A. Chole, M.D., Ph.D.
University of Minnesota, 1977
William W. Clark, Ph.D.
University of Michigan, 1975
Nancy Tye Murray, Ph.D.
CCC-A University of Iowa, 1984
Michael Valente, Ph.D.
University of Illinois, 1975

Jill B. Firszt, Ph.D.
University of Illinois, 1998
Keiko Hirose, M.D.
Harvard Medical School, 1993
Johanna G. Nicholas, Ph.D.
Washington University, 1990
Kevin K. Ohlemiller, Ph.D.
Northwestern University, 1990
L. Maureen Valente, Ph.D.
Washington University, 2005
Mark E. Warchol, Ph.D.
Northwestern University, 1989

Heather Hayes, Ph.D.
Washington University, 2009
Timothy E. Hullar, M.D.
Harvard Medical School, 1996
Rosalie M. Uchanski, Ph.D.
Massachusetts Institute of Technology, 1988

Instructors
Lynda C. Berkowitz, M.S.S.H.
Washington University, 1983
Carl D. Bohl, D.Sc.
University of Cincinnati, 1973
Christine M. Clark, M.A.Ed.
Maryville University, 1999
Christine H. Gustus, M.S.S.H.
Washington University, 1975
Barbara A. Lanfer, M.A.Ed.
University of Missouri-St. Louis, 1998

Associate Professors (Joint)
Jianxin Bao, Ph.D.
University of Florida, 1992
J. David Dickman, Ph.D.
University of Wyoming, 1985

Assistant Professors (Joint)
Lisa S. Davidson, Ph.D.
Washington University, 2003
Brian T. Faddis, Ph.D.
University of California-Davis, 1994

FACULTY PROFILES

Jianxin Bao, Ph.D., makes notes about images that reveal the electromechanical connections between nerve cells and hair cells. These synapses are central to the process of hearing. Bao looks at ways of protecting the connection, thereby delaying the onset of hearing loss or possibly treating it after it occurs.
When we understand what someone says, we process more than just the words. We also learn things such as the age and emotional state of the speaker and even sincerity or sarcasm. Hearing-impaired listeners can miss these subtler clues and often get less than a full cache of data.

“The information contained in the way we say something, versus merely what we say, is particularly important for children building language skills and developing socially,” says Rosalie Uchanski, Ph.D., research assistant professor of otolaryngology. Uchanski evaluates how well hearing-impaired people receive speech information details, such as pitch, and how this information can be delivered effectively. Her work will guide the creation of more effective cochlear implants for both adults and children with hearing impairment.

Uchanski (left) works in one of the CID building's sound-treated rooms with graduate student Kristen Peters.
Prerequisites
To be considered for admission, applicants must hold a bachelor’s degree or higher from an accredited university. Courses listed below are required for professional certification and/or licensure. Unless otherwise noted, coursework in each subject must be equivalent to three semester hours or more of academic credit.

Au.D. Program
Completion of the courses listed below is recommended, but not required, prior to enrollment. Any deficits generally can be completed during graduate studies without an extension of the program.

- general coursework in mathematics and in physical, behavioral and life sciences
- normal language development
- disordered language development
- disordered speech development

M.S.D.E. Program
Completion of the courses listed below is recommended, but not required, prior to enrollment. Any deficits can generally be completed during graduate studies without an extension of the program.

- general coursework in the arts, history and government, English composition, mathematics, oral communication, science, behavioral sciences and multicultural issues
- child and adolescent psychology
- education and psychology of the exceptional child
- normal language development
- manual communication1

1 A degree in the liberal arts generally fulfills these requirements.

Application Procedures
Applicants to the Au.D. and M.S.D.E. programs should submit the following items directly to the Program in Audiology and Communication Sciences (PACS). All items must be received by the stated application deadline:

- completed application, including personal statement
- application fee of $50 ($75 for international applicants)
- official transcripts from all college/university coursework
- three letters of recommendation, accompanied by the PACS Letter of Recommendation Form
- official scores from the GRE, submitted to Institution Code 6929 (Washington University College of Arts & Sciences), Department Code 0602 (Audiology)
- a campus visit or phone interview is strongly encouraged prior to the application deadline and can be arranged by contacting the PACS office
- official scores from the Test of English as a Foreign Language (TOEFL) for international applicants whose native language is not English.

Individuals interested in applying may obtain application and recommendation forms from the PACS office, from the back of this booklet or at pacs.wustl.edu. Applicants to the Ph.D. program must apply online through the Graduate School of Arts & Sciences at graduateschool.wustl.edu.

Application Deadlines
All application materials for the Au.D. and M.S.D.E. programs must be received by February 15. Applications completed after this deadline will only be considered for placement on a wait list and/or if there is a space in the program.

All application materials for the Ph.D. program must be received by January 15.

Applicants to the M.S.D.E. program may also elect to submit application materials by the early consideration deadline of December 15. A limited number of admission offers will be made following this deadline.
Financial Information

Tuition and Fees

Full-time tuition for students entering the Au.D. and M.S.D.E. program during the 2011-12 academic year is $29,500 per year plus a matriculation fee of $150. Part-time tuition is $800 per semester hour. Tuition rates will not increase above the amount set at the time of enrollment, assuming continuous full-time enrollment. Full-time tuition also includes student health, life and disability coverage through Washington University School of Medicine.

The Ph.D. program follows the tuition and fee structure of the Graduate School of Arts & Sciences. For more information, please visit graduateschool.wustl.edu.

Additional fees may be required for international students.

Financial Assistance

PACS is committed to enrolling talented, motivated students from diverse backgrounds. Historically, we have been able to provide financial assistance to 100 percent of our students through a variety of support mechanisms.

Scholarships are the primary form of financial support for our students. Offered at the time of admission, scholarships are guaranteed for all years of study, provided the student remains in good standing. There is no work requirement in exchange for the scholarship during the student’s enrollment. A service obligation may be required for some scholarship recipients.

- Au.D. student scholarships generally reduce the amount of the annual tuition owed by 25 percent to 50 percent.
- M.S.D.E. student scholarships may reduce the amount of annual tuition by up to 100 percent.
- Ph.D. students generally receive similar funding in the form of partial tuition remission of up to 80 percent. Federal grant opportunities that provide full tuition and stipend support may also be available on a competitive basis.

Following admission, a number of other opportunities may also be available. Announcements and information are distributed to students directly as these are available.

- A limited number of assistantships are available on a competitive basis. These positions typically provide a financial award in exchange for a work commitment to PACS, such as serving as a teaching or clerical assistant.
- Federal work-study positions may be available to qualified students. Such positions generally involve clerical work within PACS.
- Part-time, paid positions are often available. Recent positions have involved working with children in the school or a position in a research lab.
- A number of other internal scholarships and awards are also available on an annual basis following matriculation.

The Office of Student Financial Planning can provide applicants to the Au.D. and M.S.D.E. programs with information on loan opportunities. Au.D. and M.S.D.E. applicants, please call (888) 840-3239, e-mail money@msnotes.wustl.edu or visit wumsfinaid.wustl.edu for information. Ph.D. applicants, please call (314) 935-6821 for information.

Minor

A minor in Speech and Hearing Sciences is available to qualified students enrolled in the College of Arts & Sciences at Washington University in St. Louis. This minor provides students with an introduction to the fields related to speech, hearing, language and deafness, and can also be designed to meet prerequisite requirements for students interested in entering graduate programs in audiology, deaf education, or speech-language pathology.
PACS 234. Introduction to Speech and Hearing Sciences and Disorders
Introduction to the fields of audiology, education of hearing-impaired children, and speech-language pathology. Normal speech, language and hearing processes are discussed, as well as communication disorders. Selected research topics in speech and hearing sciences are also presented.  
Credit: 3 units.

PACS 401. Anatomical and Physiological Bases of Speech and Hearing
Introduction to anatomy and physiology of the peripheral hearing system and central nervous system, including functional descriptions of the systems and processes underlying speech and hearing function and dysfunction. 
Credit: 4 units.

PACS 4011. Behavior Management
Introduction to various behavior management systems effective in both individual and group environments. Behavior modification, environmental controls, psychodynamic techniques and biophysical interventions are discussed, observed and practiced. Focus is on working with deaf and hearing-impaired children. Lectures and experience with children. 
Credit: 2 units.

PACS 414. Hearing (Psychoacoustics)
Study of the basic auditory phenomena: sensitivity, psychophysical attributes, masking, localization, adaptation and complex auditory perception.  
Credit: 3 units.

PACS 416. Evaluation Techniques for the Hearing and Language Impaired
A basic introduction to psychometrics with emphasis on the selection, interpretation, and evaluation of tests. Specific techniques for assessing intellectual, educational, linguistic, and personality development in the hearing and language impaired, from infancy through adolescence, are discussed and demonstrated.  
Credit: 3 units.

PACS 421. Introduction to Electroacoustics
Introduction to the physics of sound. Topics include production, transmission, and reception of sound and factors affecting human communication. Includes discussion, lectures, problems and lab.  
Credit: 3 units.

PACS 422. Basic Acoustic Measures
Introduction to the physics of sound. Topics include production, transmission, and reception of sound and factors affecting human communication. Includes discussion, lectures and lab.  
Credit: 2 units.

PACS 433. Acoustical Phonetics and Speech Perception
Acoustical analysis of speech sounds, cues and features of speech in production and perception, various effects of speech perception.  
Credit: 3 units.

PACS 434. Normal Language Development
Study of normal language development including the phonologic, morphologic, semantic, syntactic and metalinguistic aspects. Methods of language measurement, including the role of comprehension, and pragmatic aspects of language are included.  
Credit: 3 units.

PACS 436. Introduction to Manual Communication
Analysis and comparison of American Sign Language (ASL) and other sign systems used by individuals who are hearing impaired.  
Credit: 2 units.

PACS 443. Aural Rehabilitation for Children
Provides students with a broad understanding of amplification systems and principles and methods of aural rehabilitation as they apply to hearing-impaired children. Amplification systems to be covered include digital hearing aids, cochlear implants and a full range of assistive devices. Aural rehabilitation topics emphasize patient management and include communication strategies, conversation styles and speech recognition assessment. Students will be provided with videotapes, live demonstrations and in-class activities. Direct contact with children also will be used to support lectures and discussions.  
Credit: 1 unit.

PACS 444A. Amplification Systems and Aural Rehabilitation for Children (Lab)
This course serves as the lab for PACS 444.  
Credit: 2 units.

PACS 4500. Observation in Education of the Hearing Impaired
Supervised observation in education of the deaf/hearing impaired.  
Credit: 1.5 units.

PACS 4501. Observation and Practicum in Education of the Hearing Impaired
Supervised observation and field experience in education of the deaf/hearing impaired prior to practicum.  
Credit: 2 units.

PACS 4511. Practicum in Education of the Hearing Impaired
Supervised practicum in education of the deaf/hearing impaired.  
Credit: 1.5 units.

PACS 4512. Practicum in Education of the Hearing Impaired
Supervised practicum in education of the deaf/hearing impaired.  
Credit: variable, maximum 6 units.

PACS 4513. Practicum in Reading for the Hearing Impaired
Supervised practicum in teaching reading to the deaf/hearing impaired.  
Credit: 1.5 units.

PACS 4514. Practicum in Reading for the Hearing Impaired
Supervised practicum in teaching reading to the deaf/hearing impaired.  
Credit: 1.5 units.

PACS 4515. Language Instruction for Hearing-Impaired Children
Principles and methods of developing competence in spoken English in hearing-impaired children, birth to 12 years. Includes presentation of instructional techniques for teaching hearing-impaired children. English vocabulary and syntax as well as techniques for developing and encouraging spoken language for communicating.  
Credit: 3 units.

PACS 4525. Reading Instruction for Hearing-Impaired Children
Principles and methods of developing reading competence in normal-hearing and hearing-impaired children with an emphasis on the stages of development and appropriate teaching sequences. Various approaches to teaching reading to normal-hearing children are presented, and appropriate adaptations for hearing-impaired children are discussed as well as techniques and materials designed specifically to accommodate to the language deficit exhibited by some hearing-impaired children.  
Credit: 3 units.

PACS 454. Education Curricula for Hearing-Impaired Children
Principles and methods of teaching subject matter, including written language, science, social studies, mathematics and physical education, and the use of instructional technology. Mainstreaming is
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit</th>
<th>Course Description</th>
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<tbody>
<tr>
<td>PACS 455</td>
<td>Education Curricula for Hearing-Impaired Children</td>
<td>3 units</td>
<td>Principles and methods of teaching subject matter including written language, math, science, social studies, art, music and school health education. Use of instructional technology and transition issues are emphasized. Lectures, demonstrations, observations and some practice teaching.</td>
</tr>
<tr>
<td>PACS 4612</td>
<td>Practicum in Audiology</td>
<td>3 units</td>
<td>Supervised practicum in audiology.</td>
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<tr>
<td>PACS 4613</td>
<td>Practicum in Audiology</td>
<td>3 units</td>
<td>Supervised practicum in audiology.</td>
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<tr>
<td>PACS 4614</td>
<td>Practicum in Audiology</td>
<td>3 units</td>
<td>Supervised practicum in audiology.</td>
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<tr>
<td>PACS 4615</td>
<td>Practicum in Audiology</td>
<td>3 units</td>
<td>Supervised practicum in audiology.</td>
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<tr>
<td>PACS 4620</td>
<td>Clinical Externship in Audiology</td>
<td>12 units</td>
<td>Full-time clinical externship in audiology.</td>
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<tr>
<td>PACS 4621</td>
<td>Clinical Externship in Audiology</td>
<td>12 units</td>
<td>Full-time clinical externship in audiology.</td>
</tr>
<tr>
<td>PACS 466</td>
<td>Rehabilitative Audiology</td>
<td>3 units</td>
<td>Principles and methods of aural rehabilitation with an emphasis on patient management. Topics include communication strategies and conversation styles, speech recognition assessment and hearing aid service provisions for adults, older persons, children and family members.</td>
</tr>
<tr>
<td>PACS 468</td>
<td>Diagnostic Pediatric Audiology</td>
<td>3 units</td>
<td>Fundamentals of audiologic assessment for infants and children. Behavioral as well as electrophysiologic procedures are presented. Assessment of auditory processing abilities are covered.</td>
</tr>
<tr>
<td>PACS 470</td>
<td>Practice Management in Audiology</td>
<td>2 units</td>
<td>Issues relating to establishing a private practice including clinical management, small business and accounting practices, models of private practice, referrals and reimbursement, and managed care.</td>
</tr>
<tr>
<td>PACS 472</td>
<td>Professional Issues and Ethics in Audiology</td>
<td>2 units</td>
<td>Information on the organization, administration and evaluation of audiology programs in universities, schools and other clinical settings. Professional roles and ethics in supervision, direct clinical service and consultation. Federal and state laws related to certification and licensure will be presented. Topics may vary from year to year.</td>
</tr>
<tr>
<td>PACS 475</td>
<td>Auditory Neuroscience</td>
<td>1 unit.</td>
<td>Development of an in-depth understanding of issues related to auditory neurophysiology from the auditory nerve to the cortex.</td>
</tr>
<tr>
<td>PACS 487</td>
<td>Counseling for Audiology</td>
<td>2 units</td>
<td>Comprehensive course covering the assessment, diagnosis and treatment of vestibular disorders.</td>
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<tr>
<td>PACS 501</td>
<td>Electrophysiologic Techniques I</td>
<td>3 units</td>
<td>Introduces basic concepts in administration and interpretation of physiologic and electrophysiologic measures with focus on auditory evoked potentials (AEP). Content covers basic instrumentation, parameters and variables affecting the AEP, auditory brainstem response (ABR), middle (MLR) and late (LLR) evoked potentials, auditory steady state response (ASSR) and otoacoustic emissions (OAE).</td>
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<tr>
<td>PACS 502</td>
<td>Electrophysiologic Techniques II</td>
<td>3 units</td>
<td>A continuation of PACS 5001. Advanced concepts related to the administration and interpretation of physiologic and electrophysiologic measures. Content includes in-depth study of ABR and other auditory evoked potentials and the clinical application of these for the audiologist. Additional topics include study of electrocochleography (ECochG), P300 auditory responses and mismatched negativity (MMN). This course will include a thorough study of intraoperative monitoring including neurophysiology and anatomy review, cranial nerve monitoring, spinal cord monitoring and facial nerve monitoring.</td>
</tr>
<tr>
<td>PACS 505</td>
<td>Auditory Neuroscience</td>
<td>2 units</td>
<td>Comprehensive course covering the assessment, diagnosis and treatment of vestibular disorders.</td>
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<tr>
<td>PACS 507</td>
<td>Auditory Neuroscience</td>
<td>2 units</td>
<td>Comprehensive course covering the assessment, diagnosis and treatment of vestibular disorders.</td>
</tr>
<tr>
<td>PACS 519</td>
<td>Psychosocial and Educational Aspects of Deafness</td>
<td>2 units</td>
<td>Educational, legal, philosophical, cultural and political influences related to the deaf/hearing impaired. Impact of pre-lingual and post-lingual deafness on an individual's social and psychological functioning. Deaf culture also discussed.</td>
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</table>

**Notes:**
- **PACS 460:** Observation and Practicum in Audiology
  Supervised observation and practicum in audiology.
  Credit: 1 unit.

- **PACS 4610:** Practicum in Audiology
  Supervised practicum in audiology.
  Credit: 3 units.

- **PACS 4611:** Practicum in Audiology
  Supervised practicum in audiology.
  Credit: 3 units.
PACS 543. Survey of Speech and Language Disorders
Surveys a broad range of speech and language disorders in terms of associated characteristics, assessment techniques and treatment considerations.
Credit: 2 units.

PACS 544. Clinical Observation and Methods in Speech-Language Pathology
Provides students with an introduction to clinical methods and observation experiences in speech-language pathology.
Credit: 3 units.

PACS 551. Research Seminar
Covers topics related to outcomes research and evidence-based practice as a foundation for the students’ capstone projects. Additional topics may vary year to year.
Credit: 0.5 units.

PACS 551A. Journal Club
Presentation and discussion of current issues and recent research in audiology and communication sciences.
Credit: variable, maximum 6 units.

PACS 555. Early Intervention: Serving Hearing-Impaired Children Birth to Age 5
Provides an overview of early childhood development, intervention strategies, assessment techniques and teaching strategies that can be used with young hearing-impaired children, birth to 5 years.
Credit: 3 units.

PACS 558. Teaching Portfolio
Helps students in the deaf education teacher training program create a teaching portfolio that reflects their own teaching development. The items chosen by the students to place in the portfolio will represent what they teach, how they teach and why they teach. In addition, it will demonstrate their ability to reflect on and critique their own teaching especially in relation to course planning, instructional strategies, psychology of learning and assessment. Professional issues, including the résumé and interviews, will also be discussed.
Credit: 1 unit.

PACS 5601. Clinical Audiology I
An introduction to the field of clinical audiology. Covers the role of the audiologist in the diagnosis and treatment of hearing disorders, the administration and interpretation of audiologic test results, and amplification systems and assistive devices. Additional topics include relevant calibration and instrumentation requirements, audiology as a career and legal and ethical issues in the field.
Credit: 3 units.

PACS 5602. Clinical Audiology II
A continuation of PACS 5601. Clinical Audiology I. Covers hearing evaluation and diagnosis in clinical audiology from infancy through adulthood. Topics include auditory processing disorders, functional hearing loss and other advanced measures.
Credit: 3 units.

PACS 565. Hearing Devices in Audiology I
Philosophical issues related to the selection and evaluation of hearing devices including hearing aids and alternative devices. Means of adjusting hearing devices and measuring their function and benefit are covered.
Credit: 3 units.

PACS 5652. Hearing Devices in Audiology II: Hearing Aids
Advanced issues related to the selection and evaluation of hearing aids. Means of adjusting hearing aids and measuring their function and benefit.
Credit: 3 units.

PACS 5653. Hearing Devices in Audiology III: Cochlear Implants
Covers a variety of topics related to selection, fitting and rehabilitation of cochlear implant patients. Lectures and practical experience in psychophysical testing, programming of the cochlear implant and auditory training.
Credit: 3 units.

PACS 569. Hearing Disorders
Covers the nature and causes of hearing disorders including outer and middle ear, cochlear, retro-cochlear and central nervous system. Prerequisites: Permission of department required.
Credit: 2 units.

PACS 570. Independent Study
Independent work on the Independent Study.
Credit: variable, maximum 6 units.

PACS 5700. Capstone Project
Independent work on the Capstone Project.
Credit: variable, maximum 6 units.

PACS 572. Evaluating and Reporting Research in Speech and Hearing
Critical discussion of professional periodicals and current books dealing with speech and hearing disorders and related fields. Communication skills and speaking techniques are emphasized through oral presentations by the students and the critiques of those presentations.
Credit: 2 units.

PACS 574. Statistics and Research Methods
Examines experimental and field research methods as they apply to audiology and communication sciences. Covers such methods as surveys, survey interviews, content analysis and experimental design.
Credit: 2 units.

PACS 575. Special Topics
Special topics in speech and hearing sciences, audiology and/or education of the hearing impaired. Contact the department for more information.
Credit: variable, maximum 4 units.

PACS 577. Research in Speech and Hearing
Credit: variable, maximum 12 units.

PACS 587. Dissertation Research
Credit: variable, maximum 12 units.

PACS 597. Supervised Teaching in Speech and Hearing
Supervised instructional experience as a graduate teaching assistant. Under faculty supervision, a teaching assistant may earn credit by instructing undergraduate or graduate students in courses offered by PACS.
Credit: variable, maximum 12 units.

PACS 883. Master’s Continuing Student
Credit: 0 units.

PACS 884. Doctoral Continuing Student
Credit: 0 units.

PACS 885. Master’s Nonresident Credit: 0 units.

PACS 886. Doctoral Nonresident Credit: 0 units.
Application for Admission

Please complete the Application for Admission in full and submit to the address at the end of the form. The completed Application and all required supporting documents (listed below) must be received by the application deadline of February 15th, or December 15th for early applicants to the M.S.D.E. program.

- Application fee of $50 ($75 for all international applicants) – payable by check or money order to “Washington University” or by credit card through the PACS web site: http://pacs.wustl.edu
- Personal statement
- One official transcript from each college/university attended
- Three letters of recommendation, accompanied by the Letter of Recommendation Form
- Official scores from the Graduate Record Examination (GRE) – submitted to Washington University, Arts & Sciences (6929), Audiology (0602)
- Official scores from the Test of English as a Foreign Language (TOEFL) – submitted to Washington University, required for all international applicants whose first language is not English

To which program(s) are you applying?

☐ Doctor of Audiology (Au.D.)
☐ Master of Science in Deaf Education (M.S.D.E.) – Two Year
☐ Master of Science in Deaf Education (M.S.D.E.) – One Year
☐ Non-Degree Study

Term and year you plan to enroll:

First Name: ____________________________  Middle Name: ____________________________  Last Name: ____________________________

Date of Birth: __________  Sex:  □ Female  □ Male  Social Security #: ____________________________

Previous or other names under which records may be listed:

Citizenship Status:  □ U.S. Citizen  □ U.S. Permanent Resident  □ Foreign Citizen (Country: ____________________________)

Place of Birth (city, state, and country): ____________________________  Current Visa Type (if applicable): ____________________________

Race (check all that apply):  □ Asian  □ Hispanic/Latino  □ American Indian/Alaskan Native

☐ White  □ Black/African American  □ Native Hawaiian/Other Pacific Islander

Primary e-mail address: ____________________________  Primary phone number: ____________________________

Alternate e-mail address: ____________________________  Alternate phone number: ____________________________

Current mailing address: ____________________________  Expires: ____________________________

Permanent mailing address: ____________________________

List all undergraduate, graduate, and professional institutions attended or currently attending.

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<tr>
<th>Institution</th>
<th>Dates attended</th>
<th>Area(s) of study</th>
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List three individuals who will be submitting a letter of recommendation on your behalf.

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<thead>
<tr>
<th>Name</th>
<th>Title/Position/Organization</th>
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List other graduate or professional schools and programs to which you are applying:

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List the date of your most recent Graduate Record Examination (GRE) and the highest score and percentile (all test dates) received for each section.

<table>
<thead>
<tr>
<th>Date</th>
<th>Verbal Score and %</th>
<th>Quantitative Score and %</th>
<th>Analytical Writing Score and %</th>
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</table>

For all international applicants whose first language is not English, list the date of your most recent Test of English as a Foreign Language (TOEFL), the format of the examination and the total score received.

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List work experiences. In lieu of completing this section, a résumé that includes this information may be submitted.

<table>
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<tr>
<th>Employer</th>
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List any related extracurricular and volunteer activities, honors, awards, and other experiences. In lieu of completing this section, a résumé that includes this information may be submitted.

Have you visited or interviewed with PACS, or do you have a visit or interview scheduled?  □ Yes □ No

Have you ever been convicted of any criminal offense, excluding speeding and non-moving traffic violations?  □ Yes □ No
If answering yes, provide full details, including the date, nature of the offense, and the sentence and/or fine on a separate sheet.

Have you ever been required to withdraw from an institution, or been terminated or disciplined for academic integrity violations?  □ Yes □ No
If answering yes, provide full details, including the institution, action(s), and date(s) on a separate sheet.

Are you applying for full-time study?  □ Yes □ No

Please note that full-time study is required for the Au.D. and M.S.D.E. programs.

Would you like to apply for PACS tuition scholarship and/or assistantship funding?  □ Yes □ No

Do you hold any type of professional certificate or license?  □ Yes □ No
If answering yes, list these here:

Are you applying for transfer from another graduate program?  □ Yes □ No
If answering yes, list the current institution and program here:

Please prepare and attach a personal statement explaining your purpose for pursuing graduate study in this field, your specific area(s) of interest, and your future professional goals. In addition, if you believe any aspect of your application does not accurately reflect your ability to do graduate work, you may also include an explanation of these circumstances and additional factors that you feel merit consideration.

I certify that the information provided in completing this application is true and correct to the best of my knowledge. I understand that making false statements or providing incomplete information may result in the cancellation of my admission and/or enrollment. To be considered for unconditional admission, I understand that I must submit all credentials, including evidence of degree, coursework and grades, and test scores and meet all other admission and enrollment requirements.

Signature  Date

Washington University School of Medicine
Program in Audiology and Communication Sciences
Campus Box 8042, 660 S. Euclid Ave.
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Washington University encourages and gives full consideration to all applicants for admission, financial aid and employment. The university does not discriminate in access to, or treatment or employment in, its programs and activities on the basis of race, color, age, religion, sex, sexual orientation, gender identity or expression, national origin, veteran status, disability or genetic information. Present Department of Defense policy governing all ROTC programs discriminates on the basis of sexual orientation; such discrimination is inconsistent with Washington University policy. Inquiries about compliance should be addressed to the university’s Vice Chancellor for Human Resources, Washington University, Campus Box 1184, One Brookings Drive, St. Louis, MO 63130. The School of Medicine is committed to recruiting, enrolling and educating a diverse student body.
Letter of Recommendation Form

Applicant Instructions: This form should be completed by an individual who is familiar with your background and experience, and who is able to comment on your qualifications for graduate study. Please complete this section in full, sign and date, and forward to the individual providing the recommendation. The completed form and accompanying letter may be submitted directly by the recommender or may be submitted by the applicant in a sealed envelope with the other application materials.

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Criminal Background Check and Drug Screening

Incoming students in the School of Medicine must undergo criminal background checks and drug screening before matriculation because of requirements of the Joint Commission on Accreditation of Health Organizations (JCAHO). These confidential procedures are required of all health care workers, students and volunteers who participate in patient-related health care activities at the hospitals and health care facilities with which Washington University School of Medicine is affiliated. In order to matriculate, a student who has accepted admission must consent to criminal background checks, which must be completed successfully before he or she can matriculate in the School of Medicine. Consent forms will be distributed to applicants who are offered positions in the incoming class. Similarly, at the time of orientation, all incoming pre-matriculant students must submit to screening for the following substances: THC-cannabis, cocaine, opiates, amphetamines, and PCP-phencyclidine. A confirmed positive test will preclude enrollment into the School of Medicine. All costs for U.S. background checks and drug screenings are included in the stated tuition and fees. The student will be responsible for any costs associated with international background checks required for matriculation and/or practicum placements.